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480.01 Introduction

This chapter deals with some of the most challenging sections of an environmental document, namely consideration of:

- Indirect (or secondary) impacts
- Cumulative impacts
- Irreversible and irretrievable commitment of resources
- Relationship between local short-term uses of the environment and long-term productivity

See **Table 480-1** for a summary comparison of direct, indirect and cumulative effects. **Exhibit 480-1** illustrates these relationships in the form of flowcharts. **Exhibit 480-2** shows where indirect effects analysis fits in the process of analyzing impacts and developing proposed mitigation.

Table 480-1: Summary of Direct, Indirect, and Cumulative Effects

| Type of Effect | Direct | Indirect | Cumulative |
|--------------------|---|--|---|
| Nature of effect | Typical/inevitable/predictable | Reasonably foreseeable/probable | Reasonably foreseeable/probable |
| Cause of effect | Project | Project's direct and indirect effects | Project's direct and indirect effects and effects of other activities |
| Timing of effect | Project construction and implementation | At some future time after direct effects* | At time of project construction* or in the future |
| Location of effect | Within project impact area | Within boundaries of systems affected by project | Within boundaries of systems affected by the project |

* Indirect and cumulative effects could potentially occur before the project is built (i.e. speculators initiating land use actions in anticipation of project construction).

Source: *A Guidebook for Evaluating the Indirect Land Use and Growth Impacts of Highway Improvements*, Final Report APR 327, Oregon Department of Transportation and FHWA, April 2001

In the past, indirect and cumulative impacts have seldom affected FHWA/WSDOT environmental and project location decisions because guidance to help assess those impacts has been limited. The emphasis has been on direct impacts, and efforts to

* Web sites and navigation referenced in this chapter are subject to change. For the most current links, please refer to the online version of the EPM, available through the ESO home page: <http://www.wsdot.wa.gov/environment/>

improve identification and analysis of impacts have centered on areas of the most visible and immediate concern.

In recent years, the potential for indirect and cumulative impacts – particularly to aquatic resources from a watershed perspective and to air quality – has been increasingly recognized. However, indirect effects and cumulative effects are difficult to understand and assess. Indirect and cumulative effects can have repercussions for social and economic conditions, natural resources, cultural and historical resources, and other conditions.

Part of the confusion around indirect and cumulative effects is due to differing guidance derived from several statutes, primarily the National Environmental Policy Act (NEPA), and Endangered Species Act (ESA). For example, both NEPA and ESA regulations require cumulative and indirect effects analysis, but regulators differ in their application and interpretation. Similarly, NEPA and the ESA share a common threshold for determining whether to include growth-inducing effects among the indirect effects of a proposed action. Though the scope of the indirect effects analysis differs greatly under NEPA and ESA, the same causal relationship should be used for writing the NEPA document as for writing the biological opinion for ESA compliance (see [Section 436.05](#)).

WSDOT is working with federal and state agencies to refine the scope and content of guidance for addressing indirect and cumulative effects. Information in this chapter is the most current available, and will continue to be updated.

(1) Summary of Requirements

Both NEPA and SEPA require consideration of cumulative as well as direct and indirect impacts, irretrievable and irreversible commitment of resources, and the relationship between local short-term uses of the environment and long-term productivity. Cumulative impacts should be discussed in individual sections on each element of the environment, along with direct and indirect impacts. A summary of cumulative impacts may also be included in a separate section. Environmental documents should also include a separate discussion of the overall irretrievable and irrevocable commitment of resources, and the relationship between local short-term uses of the environment and long-term productivity.

Federal implementing regulations are at 23 CFR 771 (FHWA) and 40 CFR 1500-1508 (CEQ). State implementing regulations are in WAC 197-11 and WAC 468-12 (WSDOT). For details on NEPA/SEPA procedures, see [Chapter 410](#) and [Chapter 411](#).

(2) Abbreviations and Acronyms

None specifically related to indirect and cumulative impacts. See [Appendix A](#) for a general list of abbreviations and acronyms referenced in the EPM.

(3) Glossary

See [Appendix B](#) for a general glossary of terms used in the EPM.

Effect – See “Impact.”

Cumulative impact (NEPA) – Impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person

undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Defined by FHWA and Council on Environmental Quality (CEQ) regulations (40 CFR 1508.7).

Cumulative effects (ESA) – Effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR §402.02). This section applies only to Section 7 analysis and should not be confused with the broader use of this term in NEPA or other environmental laws. Defined in *Endangered Species Consultation Handbook*, March 1998.

Direct effect – Effect caused by the proposed action and occurring at the same time and place.

Indirect effect – Effect caused by the proposed action that is later in time or farther removed in distance, but still reasonably foreseeable; sometimes referred to as “secondary effect”. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8).

Impact – Synonymous with “Effect”. Includes ecological impacts (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health impacts, whether direct, indirect, or cumulative. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes the effect will be beneficial.

Irretrievable – Impossible to retrieve or recover.

Irreversible – Impossible to reverse.

Resource – Referred to in NEPA and SEPA implementing regulations as “natural or depletable” resources (CEQ 1502.16; WAC 197-11-440 (6)) and renewable or nonrenewable resources (WAC 197-11-444). FHWA Technical Advisory T 6640.8A (October 30, 1987) refers to “natural, physical, human, and fiscal resources” in guidance on irreversible and irretrievable commitments of resources.

480.02 Applicable Statutes and Regulations

This section lists the primary statutes and regulations applicable to indirect and cumulative impacts issues. See [Appendix D](#) for a list of statutes referenced in the EPM.

(1) **National Environmental Policy Act/State Environmental Policy Act**

The National Environmental Policy Act (NEPA), 42 USC Section 4321, requires that all actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations, including direct, indirect, and cumulative impacts, are given due weight in project decision-making. The State Environmental Policy Act (SEPA), RCW 43.21C, mandates a similar procedure for state and local actions. See [Chapter 410](#) and [Chapter 411](#) for detailed guidance.

In addition to direct and observable effects, agencies are required to examine effects that may be indeterminate and not easily recognized; these are referred to as “indirect (secondary) and cumulative impacts.”

Under NEPA and SEPA, an EIS also is to include “the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity;” and “any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.” SEPA includes “significant irrevocable commitment of natural resources” in the definition of “significant impacts” (RCW 43.21C.030).

A good overview of NEPA requirements and FHWA guidance is available on FHWA’s environmental home page:

 <http://www.fhwa.dot.gov/>

Click on FHWA Programs, then Environment, then NEPA: Project Development Process, then Transportation Decisionmaking, then Secondary and Cumulative Impacts (under Environmental Impacts and Mitigation).

Or by direct link:

 http://www.fhwa.dot.gov/environment/2nd_cml.htm

(2) NEPA Implementing Regulations

(a) CEQ Rules

The 1978 regulations of the Council on Environmental Quality (CEQ) implemented the action provisions of NEPA. These regulations broadly define the direct, indirect, and cumulative effects that must be evaluated. Generally, indirect effects are induced by the action. They include a variety of effects such as changes in land use, water quality, economic vitality, and population density. Cumulative impacts are less defined and may be undetectable when viewed in the context of direct and indirect impacts, but nonetheless can add to other disturbances and eventually lead to a measurable environmental change. They require that agencies examine consequences that may occur in areas beyond the immediate influence of a proposed action and at some time in the future (40 CFR 1508).

(b) FHWA Rules

FHWA implements NEPA and the CEQ guidelines with its environmental regulations (23 CFR 771). These regulations interpret the CEQ guidelines on indirect and cumulative impacts. These impacts are referenced when justification is required for the use of categorically excluded actions. Categorical Exclusions (CE) are actions which “do not induce indirect significant impacts to planned growth or land use...” or “do not otherwise, either individually or cumulatively, have any significant impacts.

(3) SEPA Implementing Regulations

The SEPA implementing regulations also specify that direct, indirect, and cumulative impacts must be considered in the EIS (WAC 197-11-70-92). For example, impacts include those resulting from growth caused by a proposal, as well as the likelihood that the present proposal will serve as a precedent for

future actions. The range of impacts to be analyzed (direct, indirect, and cumulative) may be wider than the impacts for which mitigation measures are required of applicants (WAC 197-11-060 (4)).

480.03 Policy Guidance

FHWA policy guidance is incorporated in the technical guidance documents described in [Section 480.05](#).

480.04 Interagency Agreements

None identified. See [Appendix E](#) for a complete index to interagency agreements referenced in the EPM.

480.05 Technical Guidance

Some general sources of technical guidance are the FHWA and CEQ reference materials described below.

(1) FHWA Technical Advisory

FHWA Technical Advisory T 6640.8A (October 1987) gives guidelines for preparing environmental and Section 4(f) documents. The advisory suggests the type of indirect (secondary) impacts that should be discussed in several environmental topics (land use, farmland, socio-economic, and energy). These generally involve resources that can be sensitive to change induced by a transportation project, such as the social and economic structure of a community, floodplains, and area-wide water quality. While it does not specifically address cumulative impacts, the advisory does include guidance for preparing sections on the relationship between short-term uses and long-term productivity and on irreversible and irretrievable commitments of resources (see below). This document is available on FHWA's web site:

 <http://www.fhwa.dot.gov/>

Click on Legislation and Regulations, then FHWA Directives and Policy Memorandums, then FHWA Technical Advisories, then T6640.8A.

Or by direct link:

 <http://www.fhwa.dot.gov/legregs/directives/techadvs/t664008a.htm>

(a) Relationship between Short-term Uses and Long-term Productivity

The EIS should discuss in general terms the relationship of local short-term impacts and use of resources, and the maintenance and enhancement of long-term productivity. The discussion might recognize that alternatives other than "no action" would have similar impacts. The discussion should point out that transportation improvements are based on state and/or local comprehensive planning which considers the need for present and future traffic requirements within the context of present and future land use development. In such a situation, one might then conclude that the local short-term impacts and use of resources by the proposed action is consistent with the maintenance and enhancement of long-term productivity for the local area, state, or region.

(b) Irreversible and Irretrievable Commitment of Resources

The EIS should discuss in general terms the irreversible and irretrievable commitment of resources resulting from the proposed action. This general discussion might recognize that the alternatives would require a similar commitment of natural, physical, human, and fiscal resources. An example of such discussion is given online at the FHWA web site cited above.

(2) FHWA Guidance on Indirect and Cumulative Effects

The FHWA issued interim guidance on indirect and cumulative impacts in the NEPA process on January 31, 2003. The guidance reviews existing NEPA requirements regarding consideration, analysis, documentation, and mitigation of direct, indirect, and cumulative impacts. References to indirect impact and cumulative impact guidance, State DOT procedures, and training opportunities are included. The guidance is online at:

 <http://environment.fhwa.dot.gov/guidebook/qaimpactmemo.htm>

FHWA also hosts a “community of practice” web site where information is exchanged by NEPA practitioners, including ongoing discussions on indirect and cumulative impacts.

 <http://nepa.fhwa.dot.gov>

FHWA’s August 20, 1992 memorandum and position paper provides guidance on methods to deal with evaluation of indirect (secondary) or cumulative impacts.

This paper offers background information and conceptual guidance, but does not prescribe specific techniques to be used during project analysis. For example, it suggests that an examination of indirect (secondary) and cumulative consequences should focus on the functional relationships of resources with larger systems. If these relationships are understood, then conclusions on a project’s likely indirect (secondary) and cumulative impacts to the overall system should be possible. This informal guidance is available via FHWA’s home page:

 <http://www.fhwa.dot.gov/>

Click on FHWA Programs, then Environment, then Environmental Guidebook, then Built and Social Environment, then Indirect and Cumulative Impacts.

Or by direct link:

 <http://environment.fhwa.dot.gov/guidebook/chapters/v2ch6.htm>

(3) CEQ Guidance on Cumulative Effects

A good resource for cumulative effects analysis is *CEQ Handbook: Considering Cumulative Effects under the National Environmental Protection Act* (January 1997). This handbook presents the results of research and consultations by CEQ concerning the consideration of cumulative effects. It introduces the complex issue of cumulative effects, outlines general principles, presents useful steps, and provides information on methods of cumulative effects analysis and data sources. The handbook includes an 11-step process for analyzing cumulative impacts.

The handbook does not establish requirements for such analyses. It should not be viewed as formal CEQ guidance, nor are its recommendations intended to be legally binding. The handbook is available via FHWA's home page:

 <http://www.fhwa.dot.gov/>

Click on FHWA Programs, then Environment, then Environmental Guidebook, then Built and Social Environment, then Indirect and Cumulative Impacts.

Or by direct link:

 <http://environment.fhwa.dot.gov/guidebook/chapters/v2ch6.htm>

(4) Environmental Services Office (ESO)

ESO staff are gathering examples of successful project-level environmental studies and sample methods/processes from Washington and other states to build a compendium of best practices. In addition, the ESO is working to improve its guidance regarding the assessment of indirect and cumulative effects. Watch for a new link on the ESO web site:

 www.wsdot.wa.gov/environment/

(5) Additional Resources

The most current information and additional resources can be found on the American Association of State Highway and Transportation Officials (AASHTO) Center for Environmental Excellence Internet site.

 http://environment.transportation.org/secondary_overview.asp

See also: *A Guidebook for Evaluating the Indirect Land Use and Growth Impacts of Highway Improvements*, Final Report SPR 327, Oregon Department of Transportation and FHWA, April 2001. The guidebook is available online at:

 http://egov.oregon.gov/ODOT/TD/TP_RES/docs/Reports/AGuidebookforUsingIndirLand.pdf

Appendices are available at:

 http://egov.oregon.gov/ODOT/TD/TP_RES/docs/Reports/AGidbookUsingIndirLandAPDXA-C.pdf

See also *Executive Order 13274 Indirect and Cumulative Impacts Work Group, Draft Baseline Report*, March 15, 2005, online at:

 <http://www.fhwa.dot.gov/stewardshipeo/icireport.htm>

480.06 Permits

None required.

480.07 Non-Road Project Requirements

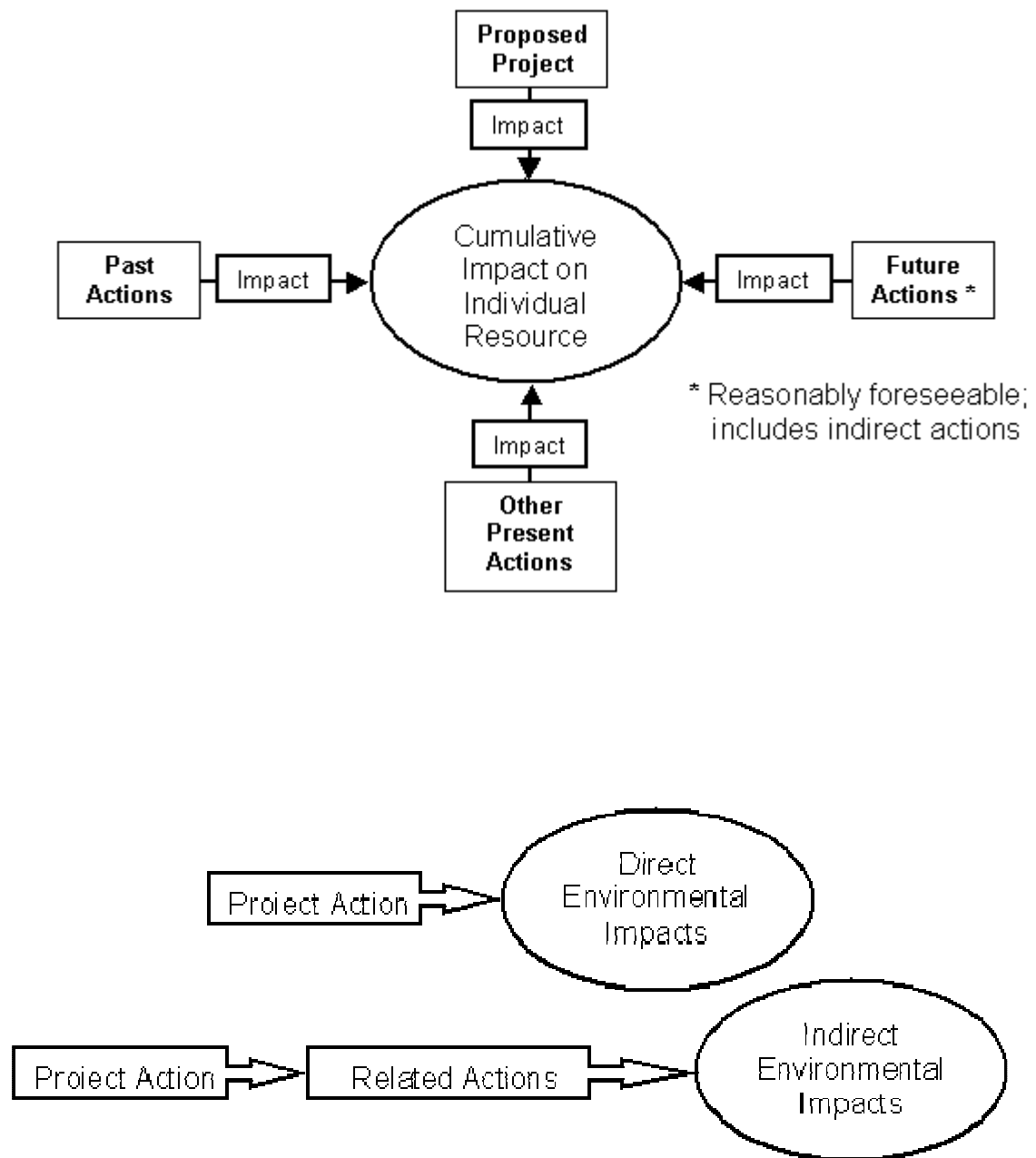
Ferry, rail, aviation, and non-motorized transport systems are generally subject to the same policies and procedures that apply to road projects.

480.08 Exhibits

Exhibit 480-1 – Indirect and Cumulative Effects Flowcharts.

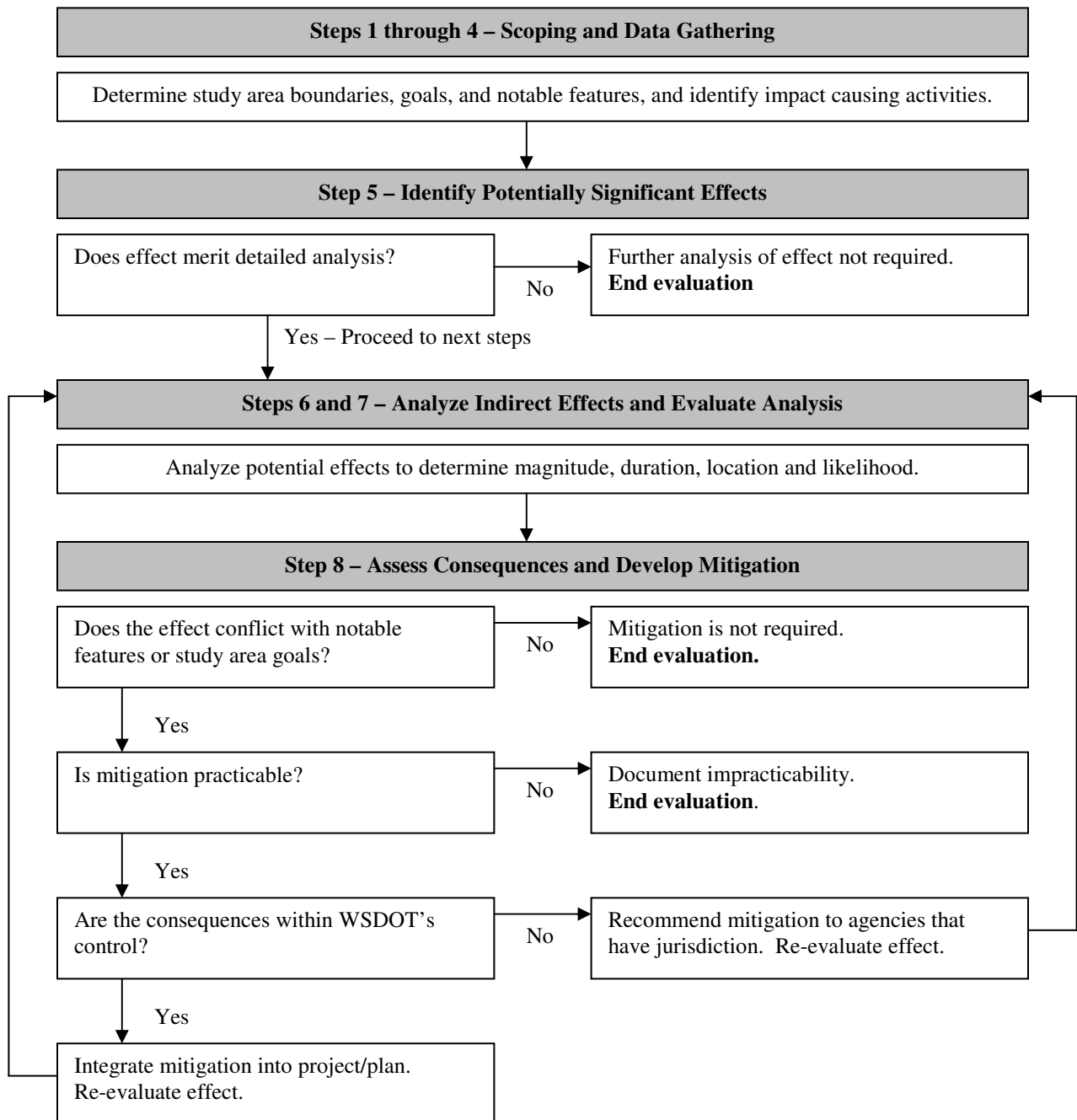
Exhibit 480-2 – Framework for Indirect Effects Analysis.

Indirect and Cumulative Effects Flowcharts



Source: *Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process*, FHWA, 2003.

Framework for Indirect Effects Analysis



Source: *Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina: Volume II: Practitioner's Handbook*, State of North Carolina, Department of Transportation/Department of Environment and Natural Resources, November 2001.